

A Review of the Genus *Xenosphex* Williams with Biological Notes¹

(Hymenoptera : Sphecidae)

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Williams (1954) described *Xenosphex* and based the genus on a male and female of a new species which he named *X. xerophila*. Later (1955) an additional specimen was collected and Williams discovered that his original pair was misassociated. He then designated the original female as the holotype of a second species which he called *X. timberlakei*. During the past decade additional specimens of *Xenosphex* have accumulated in the collection of the University of California at Davis, and in this material a third and undescribed species has been discovered.

Genus XENOSPHEX Williams

Xenosphex Williams, 1954. *Wasmann J. Biol.*, 12: 97-99.

Type of Genus: *Xenosphex xerophila* Williams. Monotypic.

DIAGNOSIS.—Head wider than thorax, thorax short, stout; abdomen sessile; mandibles notched beneath, apically toothed; base of mandible touching lower part of compound eye; compound eye bare, converging toward clypeus, facets larger along lower inner margin; glossa, paraglossa short, wide; labial and maxillary palpi four- and six-segmented, respectively; labrum small, reduced, apical margin round to obtuse with long setae; antennal socket about one-third distance from lower margin of head; occipital carina running three-fourths distance from lower margin of head; scape flattened laterally, large, nearly one-third length of flagellum; ultimate flagellomere considerably longer than penultimate; frons depressed, forming scapal basin, furrow running from antennal base to midocellus; ocelli normal, in low triangle; inner margin of compound eye angulate near vertex; pronotum flat in profile, sloping anteriorly; scutum bowed anteriorly in profile; parapsidal line, notaulus, and median scutal sulcus faint, not depressed; mesopleuron simple, with no special sulci, broadly rounded; propodeum smoothly rounded, dorsal area with flattened disc; hindcoxa, femora bulbous; midcoxa depressed anteroventrally, with lateral carina; female with strong tarsal rake, spines of rake long, flattened; tibia and tarsus strongly spined; ultimate tarsomere 2.5 times as long as preceding ones, not prehensile; pulvillus well developed, about half as long as tarsal claw, about equal size on all tarsi; midtibia with two spurs of equal length; hind tibial spurs long, lanceolate; gastral segment I narrow, tapering anteriorly, apically about as long as broad; both sexes with flat, wide pygidium; some sternites of males with apical hairbrush; marginal cell long, narrow, tapering, truncate apically, about three

¹ The study was supported in part by National Science Foundation Research Grant No. GB-3074.

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times as long as pterostigma; three submarginal cells present, the first cell widest basally, second cell with lateral sides converging and meeting anteriorly, forming a petiole of variable length; first and second submarginal cells each receiving a recurrent vein apically, occasionally first recurrent vein interstitial with first r-m or ending basally in second submarginal cell; jugal lobe of hindwing very short, one-fourth length of vanal lobe; vein cu-a at least three times as long as cu-l; male genital capsule with stout, round gonobase; parameres short, stout; digitus and cuspis heavily sclerotized, armed with stout spines; aedeagus divided medially, distal part bulbous, armed with several stout teeth; pygostyles absent.

DISTRIBUTION.—The genus is known only from California; but since one species occurs near Blythe, the range may extend into Arizona.

***XenospheX boharti* F. Parker, new species**

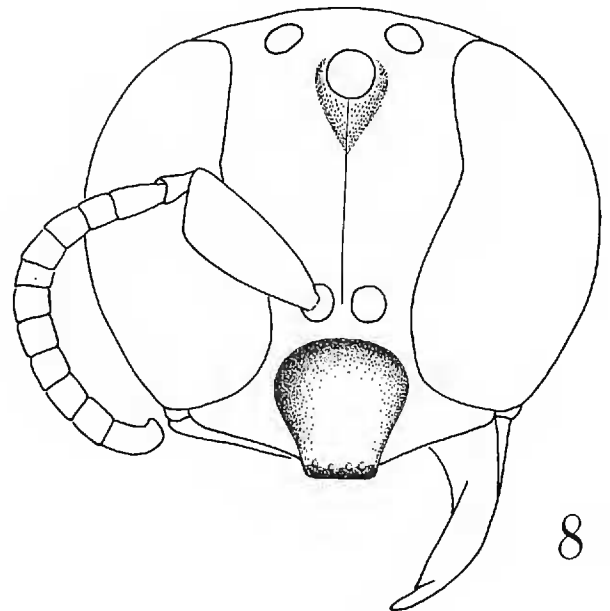
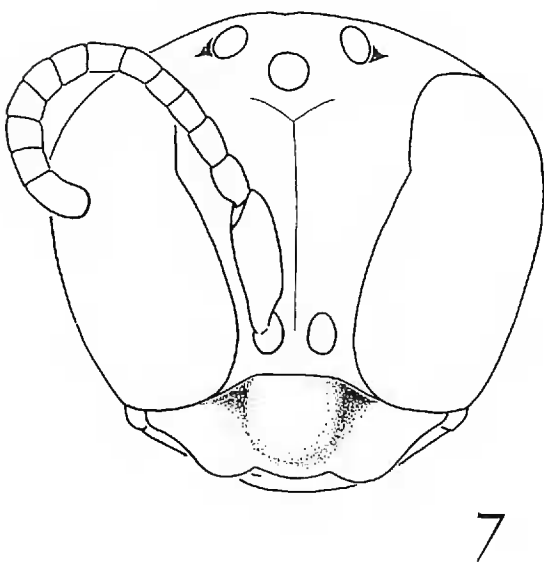
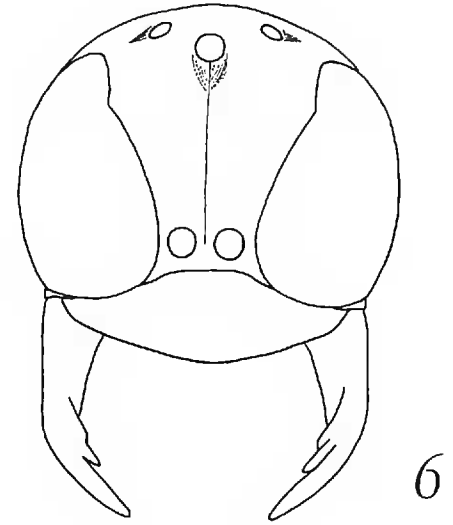
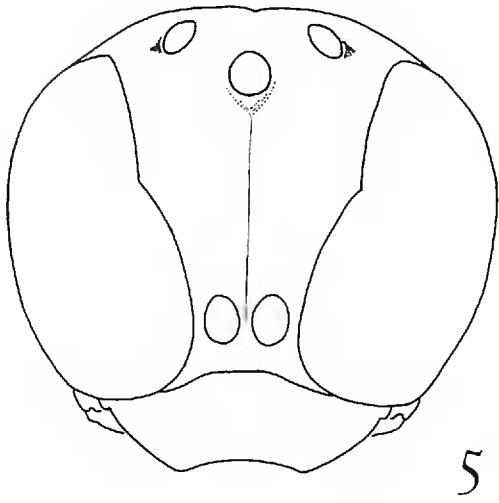
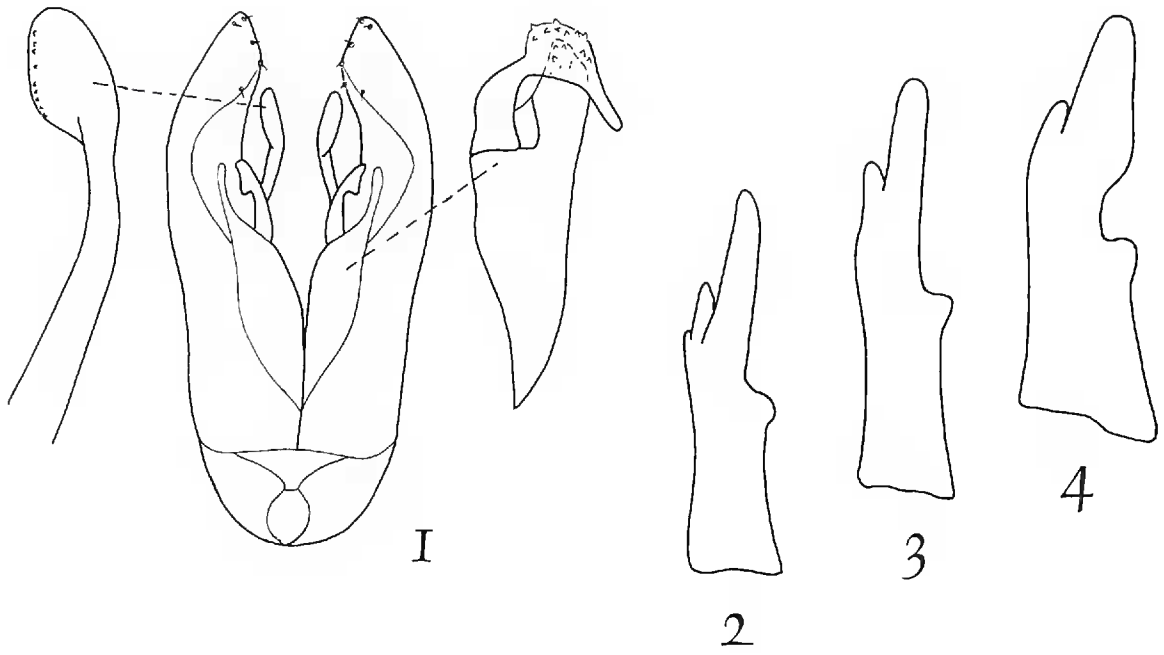
(Figs. 1, 2, 6, 7)

HOLOTYPE MALE.—Black; creamy white on mandibles, clypeus, basally on front tibia, pronotal lobe, tegula, wing base, apical band on tergites II–IV, band on II with two isolated lateral black spots, III–IV with band emarginate laterally; testaceous on scape, beneath flagellomeres, front tibia; reddish brown dorsally on femora, mid- and hindtibiae, costal vein of forewing; wings hyaline, veins brown. Body with patches of dense, silvery white, appressed hair located on the following structures: clypeus, except medially, inner eye margin, anterolaterally on scutum, epipleuron, laterally on dorsal face of propodeum, sternites with sparse, scattered, brown setae, sternites III–V with apical brown hairbrush, sternite VI with few dark setae on raised medioapical projection. Body rather smooth, somewhat shiny, but finely etched on head and thorax; propodeum shiny laterally; tergites shiny but finely sculptured. Clypeus with lateral margin lobe-like, median emargination convex; in profile clypeus with basal bulge, sloping forward, medially without pubescence; flagellomeres I and II of equal length; XI slightly crooked apically; dorsal propodeal enclosure depressed laterally, with very fine microstriae; sternite VI produced apically to blunt point, with median keel extending back from apical margin; sternite VII apically pointed, point fitting under keel and point of sternite VI; genitalia figured; length 5 mm.

FEMALE.—Essentially the same as male except: apical clypeal margin broadly rounded, without emargination; mandible three-toothed; tergite II without isolated black spot, two white basal bars present; sternites without hairbrush, apical margin of sternites VI–VII simple, pygidium very broad, micropunctate, with few scattered macropunctures, lateral margin defined by low carina.

TYPES.—*Holotype male* (UCD) and six paratypes, LONE PINE CREEK, INYO CO., CALIFORNIA, 6 June 1939 (R. M. Bohart) collected on *Eriogonum fasciculatum*.

SYSTEMATICS.—The sparsely clothed, lobed clypeus of the males (Fig. 7) and the three-toothed mandible of the females (Fig. 6) will separate specimens of *X. boharti* from those of *X. xerophila*. How-



ever, in most characters the two species are much alike and together they form a group which is very different from the other species in the genus, *X. timberlakei*. This species is named for R. M. Bohart, who was the first to collect specimens of this genus.

RANGE.—Eastern California. I have seen specimens from the type locality only.

XENOSPHEX TIMBERLAKEI Williams

(Figs. 4, 8)

Xenosphex timberlakei Williams, 1955. Wasmann J. Biol., 13: 313.

MALE.—Black; the following with creamy white markings: mandible except at apex, clypeus except medioapical part of truncation, scape in front, band across summit of pronotum, pronotol lobe, tegula, wing base, costal vein, spot on summit of scutellum, large patch laterally on propodeum, legs partly, two basal patches on tergite I, tergites II–VI with wide apical bands progressively decreasing in width posteriorly; reddish brown on flagellum, femora, and hind-coxa, venter of abdominal segment I, part of II. Vestiture silvery white, on face long, appressed, thick, mat-like except for smooth clypeal basin; that on scutum appressed, sparse; longer, erect on metanotum and hind part of propodeum; tarsomeres strongly spined apically, sternites III–VI with apical band of long, brownish, stiff setae projecting posteriorly; sternite VII with a few of these setae; wings water-clear, veins amber. Body surface very finely micropunctate, shiny except on pronotum, scutum, mesopleuron; propodeal disc with fine striae radiating from metanotum. Clypeus with median, truncate lobe, front face of clypeus with large polished basin-like depression (Fig. 8); flagellomere I much longer than II (1.3 ×); ocelli large, their diameter about as long as flagellomere I; summit of pronotum in profile lobe-like; propodeal disc shelflike, abruptly descending posteriorly; femora strongly bulbous; basal tarsomere distinctly bowed inward, produced apically; tarsomeres apically thickened; apical margin of sternites I–VI round, sternite VII broadly truncate with lateral raised welts; parameres with median dense patch of setae on venter; distal lobe of aedeagus armed with seven to eight large, stout teeth along outer margin, digitus elongate apically; length 6–9 mm.

FEMALE.—Essentially the same as the male except: clypeus with medioapical polished protuberance; scape entirely black, legs more heavily spined; pygidium pigmented, except tip, with large macropunctures, laterally bordered by carina.

SYSTEMATICS.—This species has many characters which will separate it from *X. xerophila* and *X. boharti*, but most obvious is its truncate clypeal lobe (Fig. 8). The former species have dense mats

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Fig. 1. Genital capsule of *X. boharti*, ventral view.

Figs. 2–4. Mandibles of female *Xenosphex*, side view. 2, *X. boharti*; 3, *X. xerophila*; 4, *X. timberlakei*.

Figs. 5–8. Heads of *Xenosphex*, front view. 5, male *X. xerophila*; 6, female *X. boharti*; 7, male *X. boharti*; 8, male *X. timberlakei*.

of appressed silvery hair laterally on the propodeum, whereas *X. timberlakei* has this area pigmented and sparsely clothed.

MATERIAL EXAMINED.—Forty-four males and females, 18 miles west Blythe, California, X-16-17-65 (R. M. Bohart, F. D. Parker); one male, 9 miles west Blythe, X-11-58 (J. W. MacSwain).

XENOSPHEX XEROPHILA Williams

(Figs. 3, 5)

Xenosphex xerophila Williams, 1954. Wasmann J. Biol., 12: 99–101. Essentially the same as Williams' description.

MATERIAL EXAMINED.—Twenty-four males and females, Borrego Valley, San Diego Co., California, IV-18-20 (R. C. Bechtel, E. I. Schlinger, R. W. Bushing, J. C. Hall, R. M. Bohart), one specimen taken on *Eriogonum*.

KEY TO THE SPECIES OF XENOSPHEX

1. Clypeus with median, truncate lobe, Fig. 8; flagellomere I noticeably longer than II (1.3 ×); propodeum posterolaterally with large white spot *tiberlakei* Williams
Clypeal margin either round (females) or depressed medially (males), Figs. 5–7; flagellomere I as long as II; propodeum entirely black, but posterolaterally with dense appressed patches of silvery pubescence....2
2. Scutum, scape with white; males with median clypeal notch smoothly concave, Fig. 5; female mandible with two teeth, Fig. 3 *xerophila* Williams
Scutum, scape black; males with median clypeal notch convex, Fig. 7; female mandible three-toothed, Fig. 6 *boharti* F. Parker

BIOLOGICAL NOTES ON *X. TIMBERLAKEI*

During the latter part of October 1965, R. M. Bohart and I collected a series of both sexes of *X. timberlakei* 18.5 miles west of Blythe, California, along the wash which crosses the highway at this point. The soil was very sandy with large shifting dunes bordering the western margin of the wash. The principal plants in bloom were *Pectis papposa*, *Dalea*, *Asclepias*, and mats of *Euphorbia*. Both males and females of *X. timberlakei* were found in open areas of the wash bed and along margins of the wash where patches of the composite, *Pectis papposa*, were blooming. Most wasps were observed on the sand near these small composites, but a few were on flowers. When flying insects came near the plants, the female wasps would intercept them. My first impression was that *X. timberlakei* was trying to catch small halictids, but during the 2 days of observations none of the observed wasps captured any bees.

The wasps were quite pugnacious and pursued most flower visitors. After remaining on the sand for brief periods, they took short, quick flights around the flowers, and then either took up a new position or

returned to the previous one. I captured several small bees which were then tossed near the alert wasps, but they were ignored. A short time later, I found a female of *X. timberlakei* hovering above the sand with her prey, the bombyliid, *Lordotus miscellus* Coquillett (det. J. C. Hall). It appeared that the fly was held by the hind pair of legs only, in the manner of some *Oxybelus*. The wasp landed near a burrow in the sand and was captured. An excavation of the nest revealed only a short, sloping tunnel, without prey or cells. After noting the prey, several of the flies were caught and tossed near the hunting wasps, but they were ignored also. No other wasps were observed with prey.

An unusual number of aculeates with bright red markings were collected during this time. Additionally, many of the wasps were ant-like in form and habit (nests of the harvester ant, *Pogonomyrmex*, were common at the collecting site and foraging workers were abundant). Several of the collected wasps previously were known from the types only, and many others were sparingly represented in collections. Apparently, much of this wasp fauna appears only in the fall season and, consequently, it is seldom sampled.

RELATIONSHIP WITH OTHER GENERA

Williams suggested that *Xenosphex* was a nyssonid, but it does not appear to be closely related to any of the North American nyssonid genera. If this is true, it would seem worthwhile to set the genus apart from other nyssonids and place it in a tribe by itself, the Xenosphecini. The tribe Mellinini, another group of nyssonids that provision with Diptera, is most likely the closest relative of the Xenosphecini.

LITERATURE CITED

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